SPARE Recommendations to BIFAD

Sub-Sector Reviews of USAID Programs in
Fisheries/Aquaculture
Integrated Pest Management
Sustainable Agriculture

October 1, 2003

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I. Introduction

In a letter to then-BIFAD (Board for International Food and Agricultural Development) Chair Dr. G. Edward Schuh dated May 31, 2002, Ms. Emmy B. Simmons, Assistant Administrator, Bureau for Economic Growth, Agriculture and Trade (EGAT) at the U.S. Agency for International Development, requested that BIFAD undertake a strategic evaluation of three sub-sectors within the Agency's agriculture portfolio. The three sub-sectors identified for these reviews were fisheries/aquaculture, integrated pest management, and sustainable agriculture. Specifically, the letter requested that BIFAD's subcommittee SPARE (Strategic Partnership for Agricultural Research and Education) be tasked with the responsibility of leading the reviews. The reviews were requested to assist EGAT, which has been working on a new agricultural strategy policy statement for the Agency, review these sub-sectors as part of the rethinking of this strategy. Ms. Simmons' letter asked that the reviews "make recommendations on organizational issues and future directions within these sub-sectors…(and) assess if the current organization of programs in these sub-sectors is an effective approach towards Agency goals…for agriculture."

SPARE met in Washington, D.C. on June 21, 2002 to consider the request and concluded that an effective and credible assessment could only be accomplished with the assistance of expert external panels. A budget request to support these panels was proposed and approved by the Agency. SPARE then sought input from a wide array of stakeholders to nominate members of the expert panels and, following review of the credentials of nominees, three expert panels were selected by SPARE in the late fall of 2002. The composition of the three panels was as follows:

Fisheries/Aquaculture Panel

Barry Costa-Pierce, University of Rhode Island - Chair
James Kapetsky, Consultant in Fisheries and Aquaculture Science and Technologies
Ron Hardy, University of Idaho

Sustainable Agriculture Panel

Jeff McNeely, World Conservation Union – Chair
Paul Mueller, North Carolina State University
Hans Gregersen, University of Minnesota emeritus and CGIAR

Integrated Pest Management Panel

Andrew Gutierrez, University of California, Berkeley – Chair
Ronald Stinner, North Carolina State University
Marcos Kogan, Oregon State University

Appropriate technical staff members from the Agency were assigned to each panel to provide administrative support and assistance with obtaining needed

documentation to accomplish the panel's review. Materials provided to each panel included a synthesis of a paper review of Agency programmatic activities within the sub-sector, recent relevant Agency internal program reviews of the sub-sector referenced in the synthesis, appropriate U.S. government policy documents, IARC assessments of the sub-sector (as available), CRSP assessments and recent CRSP EEP reports as available, and other relevant documentation (USDA, NAS, WB, etc.) needed to complete the review. In addition, panels were encouraged to talk to relevant stakeholders, including the CRSPs embedded within each of the sub-sectors.

SPARE met with the three expert panels' members on January 13 and 14, 2003 in Washington, D.C. to discuss the Scope of Work for the reviews. Quoting from the material developed by SPARE for this meeting, the Scope of Work for the panels included: "…assessing (1) the current state of research and development in the sub-sector and (2) the program organization in the sub-sector." The panels were charged with completing a science-based analytical review. In particular, SPARE asked the expert panels to consider the relevancy of the sub-sector to the goals of the Agency for global development and to assess the return on investment of Agency resources in the current configuration of activities within the sub-sector. Questions were asked about the contribution to and impact of the sub-sector with respect to economic growth. Panels were asked to evaluate the contribution of the sub-sector to human capacity development. Panels were also asked to determine if there are gaps or redundancies in the current array of activities supported by the Agency within each sub-sector and to suggest different or better ways to accomplish the goals of the Agency in the sub-sector. Other foci for evaluation included the generation of science-based knowledge and the institutionalization of development accomplishments in the sub-sector.

It was agreed that the panels would complete their reviews and submit draft findings in written form to SPARE by April 18, 2003. A formal public session for oral presentation of the panels' findings took place on April 30 and May 1, 2003. At the request of stakeholders, an open session was scheduled for June 17, 2003 to provide opportunity for additional input on the findings by concerned stakeholders.

The document which follows represents a distillation of the findings of each of the panels based on SPARE deliberations and internal discussions. SPARE sub-sector and cross-cutting recommendations, Sections III and IV, are submitted to BIFAD for further consideration and transmittal to the Agency for action. The Expert Panels' recommendations are provided in Annex A.

II. Synthesis of the Sub-Sector Reviews

Each review panel made a number of recommendations in their respected sub-sector review areas of Fisheries/Aquaculture, Integrated Pest Management (IPM), and Sustainable Agriculture. As expected, a number of cross-sectoral recommendations/trends emerged as well as sector specific recommendations. This section of the report provides a brief overview of each sub-sector under review.

Fisheries/Aquaculture

Fisheries play a misunderstood but important role in the world food economy. The economic value of world total fishery production in 1999 was estimated at US$ 125 billion. World production fisheries products reached 142 million tons in 2001. Fisheries are also a globally important source of employment for about 200 million people who depend directly upon ocean fishing for their livelihoods. Fish is the primary source of protein for some 950 million people worldwide and represents an important part of the diet of many more. In less than 50 years, the world's average per capita consumption of fish has almost doubled. Globally, fish provide about 16% of the animal protein consumed by humans, and are a valuable source of minerals and essential fatty acids, thus playing an important role in human nutrition.

Fisheries products have also become the most internationally traded food: some 37% of all fish for human consumption is traded across borders. In 1999, international trade (in live weight equivalent) represented 34% of the total production. In 1999, foreign trade earnings to exporting countries amounted to US$ 52.9 billion, mostly destined to developed countries. Exports of fisheries products to the developed countries have become so lucrative that nations like Argentina, a traditional, globally important exporter of meat products and livestock, have turned to seafood exports as the major source of foreign exchange earnings. Opportunities exist for developing countries to tap into this potentially valuable export market.

In the near term, global increases in consumption of food fish will take place predominantly in the developing countries, where population is growing and higher incomes are allowing the purchase of high value fisheries items for the first time by many people. Fish production in least developed countries, where fish protein is especially needed to prevent malnutrition, is a key element of food security in these regions and a critical area where innovative programs are needed to increase production.

The sustainable development and management of aquaculture and fisheries systems can only occur if these activities are well planned and integrated into the natural and social resource, ecosystems, and farming systems of the larger global context of which we are a part. Population and natural resource constraints in a crowded future demand that aquaculture "fits" as a part of a larger strategy for the non-consumptive, multiple uses of water, and that fisheries be managed sustainably as part of the larger trends affecting the marine environment.

In comparison to other sectors of the world food economy, however, the fisheries and aquaculture sectors are poorly planned, inadequately funded, and neglected by all levels of government. The vision of the sub-sector expert panel is one in which USAID is a world leader in channeling high quality, "needs directed" technical assistance in fisheries and aquaculture to developing countries, mainly in the form of capacity-building though education and training opportunities, but also in applied research.

Integrated Pest Management (IPM)

USAID has a long and distinguished track record of support of IPM. Presumably, USAID support for crop protection activities worldwide preceded the advent of IPM in the late 1960s. Early records of direct support for IPM date back to 1971 when the Agency contracted the University of California, Berkeley to manage and execute the "UC/AID project in Pest Management and Related Environment Protection" that combined the human and technical resources of nine U.S. universities to respond to crop protection needs in developing countries. In 1978, the successor to the UC/AID Project was the Consortium for Integrated Crop Protection (CICP) that added three universities and USDA/ARS to the Consortium. Since 1969, USAID funded a parallel program in weed management at Oregon State University, through the establishment of the International Plant Protection Center (IPPC) that included a strong pioneering socio-economic component, and funding to USDA's Denver Wildlife Research Center for a project in vertebrate pest management. In 1985, funding for the three aforementioned projects (CICP, IPPC, and the Wildlife) was combined and placed under CICP management until 1990 when contracts were terminated and the Agency begin exploring establishment of what became the IPM CRSP in 1993.

USAID maintains a large and complex array of programs that fall within the purview of IPM. These programs arise from disparate lines of authority, with separate programmatic arenas and display little USAID coordination among them. There are notable exceptions. For example, the IPM CRSP reports collaborative projects with other entities.

The IPM Review Panel indicated that they could not adequately address the full scope of activities and funding for IPM within USAID because of: (1) the diversity of programs with IPM components, some of which could not be retrieved from the data provided; (2) the large number of IPM activities based within other programs (e.g., commodity CRSPs); and (3) the wide array of programs with disparate funding sources. In this latter category one finds that (i) core funding ($25 million of unrestricted funds annually) for the CGIAR does not identify IPM activities; (ii) PL480 funds are used for in-country IPM training; (iii) regional programs, such as AfricaLink, do not focus on IPM, but do provide significant, but rationally non-separable infrastructure support for IPM activities; (iv) emergency programs such as the AELGA locust control project have clear IPM labeling; and (v) a myriad of in-country programs have both direct and indirect IPM components, some with "buy-in" funding for IPM CRSP and other programs. This plethora of activities might be separable were there a full, searchable database of program activities and reports, but this is currently unrealizable using the USAID Document

Database. However, even with such data, subjective decisions would still be needed for partitioning IPM components in larger projects. Rather than becoming embroiled in discussions of what constitutes an IPM activity, the Panel chose to focus on programmatic issues that they saw as impacting the major identifiable IPM activities at USAID. Therefore the EGAT's CRSP programs, core funding for the CGIAR system, and the in-country mission programs identified with IPM receive the bulk of the Panel's attention.

Sustainable Agriculture

USAID continues to be involved in many activities that fall under the broad theme of "sustainable agriculture." The early to mid-nineties period was the height of USAID's investments in "sustainable agriculture" (SA). The decline in investments that followed was due in part to a lack of a clear operational definition of what USAID includes in SA, and a steady fall in overall USAID funding for agriculture from $1.2 billion in 1985 to approximately $240 million in 1997. One of USAID's strongest contributions in SA has been its ability to link closely and effectively with other groups - NGOs, international agencies, and other bilateral programs - involved in SA activities through its CRSPs (links to US universities and other organizations), its significant contribution to the IARCs within the CGIAR, and through its partnership with local organizations and their training activities. The SAMREM CRSP, initiated in 1992, continues to be a main vehicle for USAID funding of research related to sustainable agriculture and natural resources management, along with the IARCs of CGIAR. A weakness in USAID programming is that its agriculture related activities are not systemically subject to evaluation and impact assessment; thus there is little solid documentation of actual on the ground impact of SA activities supported by the Agency.

A recent draft synthesis of discussions of a cross-sectoral USAID working group on Sustainable Agriculture and Environment, and input from stakeholders and USAID mission staff, notes that:

> Since the early 90s, a plethora of programs at Headquarter- and Mission-levels have been developed and implements that contribute to USAID's overall activities in sustainable agriculture. Of 37 activities researched from [the] late 1990s to the present, the primary components of activities have been broadly natural resource management (84%) and agribusiness (49%), with crops and agroforestry components appearing in about a third (search criteria incorporated Title XII components of agriculture including agribusiness, crops, livestock, forestry, fisheries and wildlife). Primary interventions have focused heavily on education and training (65%), and secondarily on community-based natural resources management (49%), technical assistance (43%), institution/ capacity building (38%) and research (32%) and other intervention areas. It is interesting to note that micro and small enterprise development, research, and development policy have all experienced activity decreases. One of the newest programs in sustainable agriculture is the Rural and Agricultural Incomes with a Sustainable Environment (RAISE), which started in 1998 and has a ceiling

of $200 million. The focus of RAISE is on industries that sustainably raise incomes, are environmentally sound, and promote community-based natural resource management.

The Sustainable Agriculture (SA) Review Panel concludes that SA should not be conceived as "steady-state agriculture", but rather as a different, more dynamic and realistic way to think about how agriculture, broadly defined, can contribute to sustainable poverty alleviation and food security. It is a useful "lens" through which USAID can assess it own role in supporting agriculture worldwide. The focus should be on adapting to changing conditions, resilience in the face of such changes, conservation of biodiversity, developing new partnerships, and mobilizing new resources. A sustainable agriculture must be ecologically sound, economically viable, and socially responsible. These three dimensions of sustainability are inseparable, and thus, are equally critical to long run sustainability.

The Panel emphasize that the sustainable agriculture paradigm should crosscut all issues and themes related to agriculture. Rather than considering SA as a subsector of agriculture, the Panel believes that USAID support only sustainable agriculture, and thus, SA would be synonymous with agriculture in USAID. Furthermore, the Panel indicates that USAID should not be doing anything in the agricultural field that does not lead to the sustainability of the sector and the benefits that flow from it, including when USAID projects are completed and countries take over the activities themselves. Even humanitarian or emergency agricultural assistance should be given in the context of how it affects the sustainable agriculture paradigm.

Further, the Panel suggests that USAID develop a sustainability checklist to use in assessing any proposed agricultural investment, just as environmental assessments currently are used.

III. SPARE Sub-Sector Recommendations

Specific recommendations in the Sustainable Agriculture sub-sector are that:

- ✓ USAID increase its focus and support for water related agricultural investments given that it is/will become a main constraint to sustainable agriculture in many of the poorest developing regions of the world.

- ✓ USAID continue, and as appropriate, increase agricultural investments and links to the SANREM/CRSP, CGIAR/IARCs, and land grant universities to sustain institutions and best practices related to sustainable agriculture.

- ✓ USAID adopt, as part of its approach to sustainable agriculture development, appropriate consideration of non-domestic ("wild") elements of agroecosystems.

Specific recommendations in the IPM sub-sector are:

- ✓ USAID develop a vision and strategically plan for IPM in its agriculture agenda.

- ✓ USAID make investments in habitat management and other traditional cultural control practices as part of its focus and approach in solving IPM related problems, noting that to be effective these management practices will require implementation of region wide and/or landscape level strategies.

- ✓ USAID revisit regulation 216 with a view toward developing a more coherent policy on the use of pesticides to foster their use within sound IPM practices.

- ✓ USAID foster the development and use of systems modeling and geographic information system (GIS) technology as a unifying concept for IPM research and implementation.

- ✓ USAID/EGAT coordinate the development of IPM Guides customized for regional and country specific clients. This might be done through the IPM CRSP or some other mechanism administered centrally by the Agency.

Specific recommendations in fisheries/aquaculture are that:

- ✓ USAID prioritize the improved management of coastal marine and inland fisheries (freshwater fisheries) by providing technical assistance to evolve innovative fisheries and aquaculture management schemes in developing countries, including but not limited to, property rights, co-management, and the use of marine protected areas; taking into account environmental

sustainability; plus assist in the development of more accurate and reliable fisheries and aquaculture data reporting systems.

IV. SPARE Cross-Cutting Recommendations

All Agricultural Research and Development Programs

- ✓ SPARE recommends that USAID create mechanisms to increase communication and collaboration, and foster the building of relationships across sectors using sustainability and the conservation of natural resources as a guiding principal in project planning and implementation.

Institution and Human Capacity Building - an urgent need to re-engage. The Agency's near abandonment of agricultural institution and human capacity building from the 90s to the present is seen as an area needing immediate attention and support to reverse the trend. U.S. universities and the CRSPs have been a major force in providing advanced degree educational programs and developing linkages with host country institutions to promote agricultural development.

- ✓ SPARE recommends that the university community and USAID should seek innovative and efficient means of implementing educational programs, in particular in conjunction with IARC, NGO and private sector partners. Information technologies such as the internet should be used to facilitate meeting this development need.

Monitoring, Evaluation and Impact Assessment. The Agency has reduced its monitoring and evaluation of programs, including those in agriculture. At the same time, new tools are providing better means for measuring and monitoring program impacts. The resulting data can be helpful in ex-ante planning and ex-post evaluations, as well as in demonstrating potential benefits of agricultural investments. Both the CRSP and CGIAR communities have contributed to USAID's strategic thinking on impact, and both EGAT and the Bureau for Africa have supported consultative and innovative approaches to impact measurement.

As yet USAID has not settled on a standardized data collection mechanism or data base management system. One concern that needs to be considered is the long-term nature of research, and the importance of not sacrificing important long term goals to those less significant but more achievable near term. A further challenge exists in discerning progress in researchable objectives with impact, per se. Competing short and long-term objectives complicate the development of indicators, but nevertheless the need for indicators exists and standardized indicators should be developed. Web-based reporting systems and the use of GIS as appropriate can facilitate application of standards and use of the data for adaptive management and long term development planning. Links among data bases of USAID partners (CRSP, CGIAR, others) should become common practice to facilitate standardized data bases and to further utilization.

In moving forward, it will be important for EGAT to work in a coordinated fashion and in concert with regional bureaus, especially the Bureau for Africa. New initiatives, such as the Initiative to End Hunger in Africa, demand effective monitoring

systems and offer the agricultural community the opportunity to look at its contributions in the context of the Millennium Development Goals.

- ✓ SPARE recommends the Impact Assessment Task Force continue its work in moving toward an integrated data base system that can be used to strengthen analytical, results-based decision-making and program advocacy in USAID's agricultural research and development portfolio.

Biotechnology as an Important Tool for Development. Although the sub-sector reviews considered some actual and potential applications of biotechnology, they did not undertake a comprehensive review of the new tools offered by molecular biology. SPARE remains convinced of the need for judicious consideration of all relevant research approaches, including biotechnology, in determining appropriate investments. In doing so, it is important to bear in mind that, while far from a panacea, biotechnology does offer new means of solving age-old problems of pest, disease and even abiotic stress challenges. Generally it is deployed in conjunction with crop improvement, livestock health, natural resource management, integrated pest management and other strategic activities. Biotechnology should be seen as an integral part of USAID's broader agricultural research and technology investments. As such, capacity building opportunities will be widespread and diverse at both the human resource and institutional levels, and this is entirely appropriate.

USAID does have a special and unique role to play in fostering integration of biotechnological approaches. First, the U.S. university and private sector offer an unparalleled level of capacity and commitment to form global partnerships that benefit developing countries. Second, unlike many development organizations, USAID is not constrained from considering biotechnology in an objective and dispassionate manner.

- ✓ SPARE recommends that USAID take a leadership role in integrating biotechnology techniques to broader science and technology efforts aimed at resolving development problems. Appropriate attention to the context--social, economic, cultural, political, and bio-safety—must also be taken into account. As emphasized in the sub-sector reviews, systems analyses may be useful in assessing the potential of biotechnology in specific applications. USAID should continue its efforts to integrate research innovation, regulatory development and commercialization.

Trade and Free Market Impact on Developing Country Agriculture. The impact of free trade and free markets, trade barriers, regulations and bio-safety requirements may vary from country to country. The U.S. university community in conjunction with IARCS, particularly IFPRI, can assist development partners by conducting analyses on projected impact of domestic, regional, and global markets and trade on those countries. Emerging USAID priorities increasingly portray markets and trade and science and technology as the "legs" on which agricultural development, poverty reduction and food security goals will advance.

- ✓ SPARE recommends that the research community pay greater attention to markets, while not losing sight of research opportunities in important cropping, livestock, and resource management systems.

Community based approaches to problem solving. Agency programs should continue their focus to resolve problems and improve the lives of poor people. This requires judicious analysis of equity impacts of agricultural and natural resource management research and development investments. Rigorous economic analysis is needed, both at the macro/trend level and at the farm/community level. Community-based approaches offer an important means for U.S. universities, IARCs, NGOs and private sector based partners to verify that proposed solutions to problems are appropriate.

- ✓ SPARE recommends that community-based approaches be considered when designing new programs and projects.

Collaborative Research Support Programs (CRSPs)

Competition Open to U.S. Universities. The development issues that USAID faces are dynamic, as are the many partners in its efforts. It is important that human and institutional resources in the U.S. university community, where many potential partners exist, be afforded the opportunity to propose new and innovative approaches, and competing visions, of research that can be brought to bear on solving agricultural development problems. Free and open competition should govern participation in university led programs.

- ✓ SPARE recommends that all CRSP Management Entities should be re-competed in a ten-year cycle. The first of these re-competitions would occur with the IPM and SANREM CRSPs. To be closely monitored by SPARE.

- ✓ SPARE recommends that the IPM and SANREM CRSPs pilot the use of the Leader With Associate (LWA) procurement mechanism in order to ascertain its suitability to the existing CRSP budgetary and programmatic structure. It was pointed out that there remain unanswered questions as to whether the LWA is compatible with CRSP responsibilities, tasks, and procedures, and that a pilot program would help to determine if the LWA could be more broadly applied to the CRSP procurement process.

- ✓ SPARE recomends that the PD/A CRSP be extended to complete a full 10 year cycle.

International Agricultural Research Centers (IARCs)

The sub-sector reviews underscored the important benefits that can accrue to U.S. universities and IARCs working together. IARCs need to take full advantage of the scientific capacity available in the U.S. and other countries, being careful not to duplicate

unnecessarily capabilities more efficiently accessed from research partners in the U.S. and elsewhere. USAID should examine existing and potential mechanisms for fostering such linkages. SPARE's 2002 White Paper on the subject provided a range of options which bear further consideration. Building such partnerships can also provide U.S. universities and other advanced research partners helpful linkages to technology development and testing programs across a set of partner countries.

- ✓ SPARE recommends that a panel of U.S. and IARC scientists be convened to identify additional opportunities that exist for seeking greater synergy between IARCs and various bilateral USAID programs across the agriculture-NRM spectrum.

- ✓ SPARE recommends that the CRSPs strengthen and improve their linkages with the IARCS, NGOs and the private sector to increase the extent of impact from CRSP research and capacity building, while benefiting those institutions through greater access to the scientific strengths of CRSP scientists. SPARE believes that the deepening of these relationships need not come at the expense of CRSP ties to other partners.

CRSP Guidelines

- ✓ SPARE recommends that the CRSP Guidelines be revised. A revision of the Guidelines was completed in 2000, but never adopted. It is recommended that new Guidelines be drafted to reflect SPARE's discussions with the CRSP Council and the wider university community, as well as reflect BIFAD decisions.

Sectoral Reviews

- ✓ SPARE recommends that an agricultural sector program review be conducted by USAID, and that the Agency's new Agricultural Strategy and the amended Title XII should serve as the basis for guiding the inquiry. The purpose of the review is to determine the congruency of the Agency's entire agriculture programming portfolio with the new Strategy and amended Title XII. The review is to identify existing gaps and redundancies in agriculture programming, as well as recommend actions to increase the sector's effectiveness.

ANNEX ONE

Recommendations from the Expert Panels to SPARE

Fisheries/Aquaculture Expert Panel Recommendations

(Section VI, Summary and Recommendations, of Panel Report)

Clearly, the needs and capabilities of developing countries in fisheries vary widely. In this report we have identified the main strategic issues and trends in fisheries and aquaculture from a global perspective. The strategy that we advocate for USAID is to identify and address the common needs within and among countries to benefit the greatest number of people for the resources available.

Considering the issues and future trends we have identified in this study, we recommend the following strategic approaches to USAID:

1. ***USAID needs to substantially increase its programmatic emphasis and enlarge its financial and human resource commitments to global fisheries and aquaculture.***

Given the importance of fish and fisheries to the global economy and their importance in poverty alleviation and food security, USAID has ample justification to increase its global profile in fisheries and aquaculture. We strongly recommend that USAID substantially increase its programmatic emphasis, funding, and enlarge its staff commitments to global fisheries and aquaculture issues. If USAID cannot increase its core commitments in these areas, the Agency should consider augmenting its core staff by rotating into USAID mid- and senior level professionals from state and federal governments, academia, NGOs, and industry.

USAID needs to make more prominent the importance it gives to the sustainability of fisheries and aquaculture at all levels of its bureaucracy: at its DC headquarters, and in all of its missions, and its regions. In addition, USAID needs to give a higher profile to capture fisheries and aquaculture issues in descriptions of its overall agriculture and natural resources portfolios. We find the word “fisheries” missing from these; and we believe aquaculture is too “buried” in lists describing a wide range of agricultural issues that interest the USAID.

2. ***USAID needs to play a central role in mobilizing America’s considerable human and institutional resources in fisheries and aquaculture to assist developing countries.***

Our vision is one in which the USAID is a world leader in channeling high quality, “needs directed” kinds of technical assistance in fisheries and aquaculture to developing countries, mainly in the form of capacity building though education and training opportunities, but also in applied research. In order to achieve this vision, we believe that the USA needs to increase its competence and competitive position in dealing with fisheries and aquaculture issues in developing countries.

USAID needs to play a central role in mobilizing America’s considerable human

and institutional resources in fisheries and aquaculture to assist developing countries. This can be brought about by a variety of initiatives, but the basic requirement is for US applied science and outreach professionals to work more often and for longer durations in developing country fisheries and aquaculture situations in a way that focuses more closely on collaborative solutions to common issues. A key element of USAID approaches must be the leveraging its organizational and leadership strengths in fisheries and aquaculture by utilizing the considerable array of expertise and talent that exists in America's government (USDA, NOAA-OAR, NOAA-Sea Grant, NOAA-Fisheries, USGS, etc.), universities, state agencies, industry, and NGOs. We encourage USAID to develop innovative ideas/proposals to link with the interests of the US State Department and the Peace Corps to develop additional policy, research, and extension capabilities. In addition, the USAID needs to better insure that its multi-lateral and bilateral investments make the most use of American expertise in fisheries and aquaculture, especially in regards to instruments and relationships with The World Fish Center, various UN organizations, The World Bank, and The Asian, African, and Interamerican Development Banks.

The Pond Dynamics/Aquaculture CRSP (PD/A CRSP) is one notable example of how the USAID can play an enhanced role in mobilizing America's considerable human and institutional resources in fisheries and aquaculture to assist developing countries. The PD/A CRSP has been involved with over 50 institutions and NGOs in 27 host countries. Since the inception of the PD/A CRSP over 200 researchers have been involved and over 400 graduate and undergraduate students supported. During the past eight years the PD/A CRSP has worked (or is currently working) with 18 US universities in 16 states. This vital capacity-building has enhanced and strengthened host countries' abilities to further develop aquaculture and provide an additional and much needed protein source to the local and regional populations. However, USAID funds have been far too limited to develop long-term University centers of excellence in capture fisheries and aquaculture; plus the CRSP lacks a broader mandate in order to engage fully in the urgent issues of nearshore and inland fisheries, marine aquaculture, coastal area management, and the comprehensive, systems-based natural resource management approaches we recommend that would ensure a sustainable future for capture fisheries and aquaculture. The USAID needs to examine how the CRSP, the USAID Cooperative Agreements, and other current/past administrative initiatives in coastal management and aquaculture could be used as models to expand long-term engagement in critical regional issues that have place-based centers and can involve an expanded collaboration between USAID/Government/Universities that could build on America's strengths and competitive position.

Foreign nationals need specialized short and long-term training in the US. Trained human resources are essential to resource management, which require, inter alia: multi-disciplinary expertise in fishery resource assessment; bio-economic and socio-economic analysis; management techniques; fishing technology, marketing and quality control; resource monitoring; fishery surveillance; and fisheries legislation. The USAID Cooperative Agreements in aquaculture, fisheries and comprehensive coastal area management with American universities were very effective programs for capacity building worldwide. These Agreements created an impressive cadre of globally important

leaders—and good will—in fisheries and aquaculture throughout the academic and governmental institutions of many nations. We urge USAID to enhance its commitments to the building of additional leadership capacities in developing nations by elevating overall human resource capabilities to better manage fisheries and aquaculture. Additional Cooperative Agreements for training on a variety of concepts and skills are needed in order to have a chance at sustaining and rehabilitating fisheries and aquaculture ecosystems in many nations, to strengthen institutions, and to improve individual performance. We recommend USAID to:

- Increase funding to and the participation of American scientists in The World Fish Center, and more generally, in the current and planned activities in fisheries and aquaculture of the Consultative Group in International Agriculture Research (CGIAR),

- Participate actively in the UN/FAO Associate Professional Officer program, so that young professionals can gain varied and broad global experiences in international settings,

- Increase the recruitment of fishery and aquaculture graduates into USAID missions and train them more extensively in pre-service at American universities,

- Fund or facilitate additional foreign student degree and certificate programs in fisheries and aquaculture and associated resource sciences at US institutions (both at universities and at US government organizations),

- Fund or facilitate additional targeted technical assistance missions (social science, economics, fisheries management, processing, labeling, GIS, HACCP, etc.),

We recommend that USAID lead a planning process that could result in establishment of formal collaborations with a suite of US government/University centers of excellence—possibly using an expanded and better funded CRSP mechanism—in order to develop additional applied science and extension/outreach capabilities in capture fisheries and aquaculture, and to better organize long-term, strategic and medium-term implementation plans and regular impact assessments of an expanded USAID portfolio in capture fisheries and aquaculture.

3. ***USAID needs to bridge the "digital divide" to develop solutions to fisheries and aquaculture issues in developing countries.***

The Internet, supported via cable and satellite, can be an outreach pipeline, not only for spatial analyses, but also for moving more general information on fisheries and aquaculture to developing countries. There is a vast storehouse of fisheries and aquaculture information in the form of on-line technical reports and publications from US government and state agencies, NGOs, universities, professional organizations, and industry that could be "piped" abroad via the Internet. In many cases, simply raising awareness of the availability and location of the material would suffice as a useful

intervention. Distance learning via the Internet, TV and radio is increasingly being used for training in developing countries. Even though, the US possesses the means to be effective in these media, training on fisheries and aquaculture using these media is not yet common.

Solutions to the problems of fisheries and aquaculture share a fundamental need of basic comparative information on causes and pathways. Nearly all of the issues are not isolated; rather they are shared by neighboring communities and countries, or topically right around the globe. Furthermore, many of them already have been experienced and treated in many areas of the world, prominently in the USA. A fundamental problem is that the applied science that has been employed and experience gained in surmounting the issues is not yet readily available to the developing world at acceptable costs. Therefore, an important advancement of USAID could be an initiative to help bridge the "digital divide" by increasing its emphasis on identifying, compiling and packaging solutions to fisheries and aquaculture issues of developing countries, and by broadening USAID involvement with many organizations specialized in technical, social and economic solutions in fisheries and aquaculture for which the USA has a comparative advantage—especially by taking advantage of the latitude within USAID for developing a broad variety of initiatives that include the US federal government and state agencies, commercial firms, NGO's, Land/Sea Grant universities, regional aquaculture centers, and international organizations. Several kinds of USAID initiatives are required to:

- Synthesize, package, and deliver applied research information by enhancing extension systems to move information to developing countries and to disseminate it in an effective manner;

- Assess the potential of distance learning to significantly improve technical and managerial competences in fisheries and aquaculture in developing countries;

- Facilitate information flow via choosing methods of information delivery that are appropriate for different audiences in different regions (increasing Internet access, radio, CDs, DVDs, videos, etc.);

- Sponsor collaborative in-country research between US professionals and applied fisheries and aquaculture professionals in developing nations on problems that are indigenous to the country or region.

We applaud the Pond Dynamics/Aquaculture CRSP in its development of the Amazon Aquaforum, an Internet-based information exchange aquaculture network in South America which supported development of a variety of technologically appropriate information delivery methods. The CRSP also maintains an invaluable, comprehensive, standardized database of information collected from throughout the world. The CRSP developed a web-based resource for small and medium-scale farmers in Latin America called the Web-based Information Delivery System for Tilapia (WIDeST), a decision-making tool that enables users to gain access to useful resources when deciding on appropriate, site specific methods and aquaculture practices.

4. ***USAID should prioritize the improved management of coastal marine and inland fisheries by providing technical assistance to evolve innovative fisheries management schemes in developing countries including but not limited to: property rights, co-management, and the use of marine protected areas; plus assist in the development of more accurate and reliable fisheries and aquaculture data reporting systems.***

USAID needs to invest additional resources to assist in achieving the long-term goal of sustaining the world's invaluable marine and inland capture fisheries, which are disproportionately located in developing countries. Additional investments in capture fisheries could positively impact and better leverage USAID's current and planned investments in coastal area management and aquaculture. Additional assistance is needed to engage users and government institutions to bolster management and governance structures to address issues of overcapacity, access, marine tenure, critical habitats and nurseries, and a priority range of social issues such as gender relations. Investigations are needed into conservation engineering (innovative gears and management); roles of reserves, protected and conservation areas; plus investigations regarding how best to protect freshwater flows to estuaries (and rivers to lakes)—especially the timing, volume, quality and pulsing of freshwater flows to critical estuaries. In addition, the USAID could play a major role in analyzing and promoting effective fisheries management, government policies, reforms, market/trade policies, and reductions of subsidies.

In comparison to the long-standing emphasis on technical investments in fisheries for stock assessments, etc., comparably little attention has been paid to the users of fishery resources. This is despite the fact that the observed successes, failures, and constraints experienced in marine and inland capture fisheries management are social and economic in nature. Another problem is that fishery researchers often have a low status and income in a given national context, have limited facilities and resources, few opportunities for in-service training, and have limited access to outside scientific research information. We recommend that the USAID expand its investments in the community-based management of marine protected areas, property rights, and overall investments in social ecology and ecosystems-based management of fisheries.

Illegal, unreported and unregulated fishing is found in all capture fisheries, irrespective of the location, species targeted, fishing gears employed or level and intensity of exploitation. USAID should work with the reporting countries to improve fishery statistics, primarily to meet national needs with regard to food security and fisheries management. Unlike capture fisheries, the separate monitoring of aquaculture is relatively new in most countries, and often there are less well-established systems of data collection as compared to capture fisheries.

5. ***USAID needs to substantially increase its support to develop more comprehensive, sustainable, ecologically and socially compatible, environmentally-friendly and economically viable aquaculture systems in developing countries that have the long-term goals of poverty alleviation and food security.***

To meet global demands for fisheries products, aquaculture will continue to grow at a rapid pace over the next 10 years; then, its rate of growth will slow until the considerable environmental constraints it faces are solved. Aquaculture faces a number of important problems, including access to appropriate technologies, lack of comprehensive, inter-sectoral planning, a lack of financial resources for the poor, information on its environmental and social impacts and diseases. The priority areas for further applied research support include:

- land, water and feed/nutrient use in aquaculture in comparison with other animal protein production systems;
- sustainable intensification and non-consumptive water use in freshwater aquaculture production;
- participatory management approaches to the comprehensive development of aquaculture ecosystems as sustainable means of rural development;
- sustainable coastal aquaculture development, especially technologies that avoid user conflicts;
- social and economic research to add insights into the adoption of aquaculture by poor rural households;
- genetically advanced technologies for sustainable stock enhancement and ranching programs, plus the domestication, selective breeding, and genetic improvement of existing aquaculture species;
- technologies to solve disease problems and innovative management solutions to improve the health of aquatic animals;
- development of low cost, non-fish meal based feeds;
- training in the quality and safety of aquaculture products; and
- research in making emerging technologies cost-effective, including recirculating systems, and offshore aquaculture systems.

The appropriate role for the USAID in fisheries and aquaculture biotechnology is to support applied research and outreach activities that engage in well-known, conventional genetic improvement techniques, such as selective breeding, etc., as opposed to research support to advanced biotechnologies, such as transgenics. USAID support for The World Fish Center's program on the genetic improvement of farmed tilapias (GIFT)—and the development of international protocols for product dissemination—is an excellent example of the types of biotechnology investments the merit USAID's future consideration. However, it is also very important that USAID

engage nations who have large and active programs in advanced fisheries/aquaculture biotechnology—such as China—in issues of policies, protocols, environmental, market and other social impacts of transgenics.

6. ***USAID should prioritize its assistance to capture fisheries and aquaculture activities that are more integrated, comprehensive, community-based, and use "systems approaches"—such as ecological and integrated farming/fishing systems research and extension approaches—in both rural and urban settings. The current agriculture emphasis of USAID is on plant commodity research, not on a comprehensive, agro/aqua-ecosystems research/extension approach. We urge the USAID to support long-term, applied research and development that makes expanded use of participatory ecological and social science tools to empower community control of fisheries and aquaculture systems; and to better integrate aquaculture and fisheries activities into the comprehensive management of natural and social resources of its missions, target nations and regions.***

The kinds of assistance provided by USAID should be based on a combination of: (1) assessed needs and capabilities in developing countries, and (2) the comparative advantages held by the USA in technical expertise, education, communications, business management and commercial products**.** Assistance focused on US comparative advantages provides a way to get around duplication of effort among competing international organizations, while still fully supporting the Code of Conduct for Responsible Fisheries. The top priority for USAID should be the sustainable development of community-based, integrated farming and fishing systems with the long-term goals of poverty alleviation and food security.

Aquaculture and fisheries activities are frequently poorly planned and considered; funded separately from activities that greatly impact them; and are generally neglected by all levels of government. Fisheries activities should be planned as a continuum, and comprehensively as part of the planning for integrated natural resources management (water, wastes, agriculture, etc.), and the sustainable development of human communities. Fisheries and aquaculture information should be linked/coordinated with activities in other sectors (e.g., agriculture, forestry, food processing, distribution, etc.). Fisheries and aquaculture should be planned up-front—not as an afterthought—in all water resource development projects such as reservoir and irrigation projects. Coordination is both justified and essential because of shared issues with other sectors of sustaining biodiversity, maintaining water quality and quantity, the management and development in coastal areas and in river and lake basins, and addressing environmental degradation, mitigation and restoration, and the need to improve governance. USAID is encouraged to prioritize its support to applied research and development activities that articulate well with the natural and social resource and farming systems contexts of a nation/region, and (a) plan for the activities as one part of a comprehensive management strategy for the non-consumptive, multiple uses of water; and (b) use ecosystems-based management approaches that promote the more comprehensive, long-term stewardship of marine and freshwater environments.

We urge the USAID to support the expanded use of participatory tools to empower community controls over fisheries and aquaculture systems; to use innovative co-management methods to sustain local water and coastal resources, and the community-based management of water bodies for fisheries and aquaculture. Fisheries and aquaculture provide foods of very high nutritional value for households. When resource-poor fishers and farmers combine fisheries, agriculture, aquaculture and the conservation/rehabilitation of natural resources in innovative "ecosystems approaches"' they improve their food supplies, increase their incomes, and become better able to withstand environmental and economic fluctuations; thereby decreasing risks, increasing fishing and farm sustainability, and contributing greatly to rural social and economic development. We encourage the USAID to incorporate additional, applied social science and micro-economics research into innovative ecosystem-based methods that empower communities to better manage and control fisheries systems, and to develop more environmentally and socially compatible aquaculture systems (protected areas, property rights, innovative co-management approaches, etc.). Most of the modern aquatic resource crises have roots in social issues that are poorly known, such as the "shifting nature of modern survival" in developing nations. Millions of people do not only fish or farm, rather, they derive income from multiple activities and sources, and in some cases, conduct long distance seasonal migrations between inland farming systems and fisheries systems, and vice versa. USAID is encouraged to support the development of aquaculture systems that are well integrated into existing water resource systems, are virtually non-consumptive of water, and make multiple uses of water.

Aquaculture has the potential for small business development but additional technical assistance is needed by business professionals familiar with economics, labor dynamics, opportunity costs, issues of price and volume competition, and other commercial and competitive contexts of other sectors such as agriculture, etc. The recent activities of the Pond Dynamics/Aquaculture CRSP (PD/A CRSP) are notable in this regard. In 2002, the CRSP conducted regional meetings in Latin America, the Caribbean, Africa, and Asia, plus commissioned a report to explore the current status of aquaculture in Eastern Europe/Central Asia. Participants represented diverse areas of expertise; gender diversity was also a criterion of panel composition. During the meetings, participants were asked to identify and prioritize constraints to aquaculture development in the region of their expertise. Three central needs-directed program areas emerged after analyzing the results of the meetings. This movement of the PD/A CRSP to become more of a "system-oriented" network as opposed to a "commodity" collaborative is noteworthy and laudable; and if additional resources were available, these concepts could be developed further.

We cannot emphasize more strongly that poorly-funded, short-term projects with broad, "global" goals will not make lasting impacts on the conservation and sustainable development of fisheries and aquaculture systems in developing countries; and that these approaches do not serve the strategic interests of the United States. Research, education and extension assistance must target the long-term engagement of institutions, and deliver approaches, findings and insights towards these institutional systems and organizations

that will continue the long-term engagement with farmers/fishers that can weather the invariable fluctuations in development assistance that will occur over time.

7. ***USAID needs to develop comprehensive strategic and implementation plans and regular impact assessments of an expanded capture fisheries and aquaculture portfolio. USAID missions and regions worldwide should include capture fisheries and aquaculture into their strategic plans for the management of natural resources—or they will be incomplete—especially in regards to USAID plans for involvement in the issues of water allocation and quality, and plans for the comprehensive management of marine and inland coastal areas.***

USAID needs to sustain a strategic, long-term commitment to fisheries and aquaculture as parts of comprehensive natural, aquatic resource management. Short-term projects should be part of larger, longer-term strategic frameworks for directed action that have adequate accountability to measure strategic progress and impacts. USAID needs to conduct regular, transparent processes that result in the publication of strategic and implementation plans for fisheries and aquaculture over 5 to 10-year time frames. The movement from short term projects to longer term investments in centers of excellence, for example, will require the USAID to develop strategic planning and assessment processes that are much more comprehensive and "living". With more stable investments strategic plans have a shorter "shelf life" and require more frequent review and evaluation in order to make the necessary "mid-course changes". We recommend a process similar to that used by Standing Committees of the U.S. National Research Council where external expert advisors regularly measure progress on investment portfolios.

Within the fisheries sector, USAID should take advantage of shared needs for land and water resources and issues in common to identify sub-sector groupings for directed technical assistance and development activities. We identify two groups that require distinct interventions: (1) offshore (i.e., within the EEZs) and high seas fisheries share common issues of resource and fisheries management that include shared resources, over harvesting, and excess capacity, and (2) coastal and inland fisheries as well as aquaculture to a great extent, may interact both positively and negatively with one another, sometimes competing for space, resources and markets, but they also share many common issues that are external to the fisheries sector, most importantly the environment and poor governance.

Integrated Pest Management Expert Panel Recommendations
(From Executive Summary of Panel Report)

Panel Recommendations for Future USAID Activities in IPM:

First tier recommendations

1. USAID needs to develop a vision that encompasses: (i.) a major focus on strategic planning along with the efforts in tactical developments across CRSPs, (ii.) development of a durable infrastructure in IPM programs, (iii) development of unifying concepts and methods for research and implementation activities, and (iv.) development of a mechanism that assures inclusive participation of important technical resource institutions. USAID should formulate decision-making criteria for region/country/ commodity program selection that are transparent and that facilitate forging of linkages for efficient IPM problem solution across Agency funding sources. The development of such a vision would increase the effectiveness of programs, decrease costs and produced sounder science based results.

2. The IPM CRSP has made important contributions to promote IPM in several regions globally, and it should assume a greatly expanded facilitating role in IPM activities across USAID CRSPs, SANREM, IARCs, NARs, certain NGOs, the FAO-GIPMF and other relevant entities.

3. The focus of USAID should be on regional pest problems where the impact on food security and hunger is large. USAID should foster the development and use of appropriate modern science and technology to solve these pest problems (see below).

4. Natural and classical biological controls play a central role in IPM. This tactic has a tremendous record of cost effectiveness and success in controlling invasive exotic pests, and hence USAID should increase the profile of and funding for this area working mainly through USDA and relevant IARCs. The goal of USAID should be to help build and maintain regional expertise in biological control of exotic pests.

5. Host plant resistance (HPR) breeding is vital component of sustainable agriculture, but the Panel discourages investment by commodity CRSPs beyond the preliminary screening of germplasm materials for resistance to major arthropod pests and pathogens. Further research and development should be passed to IARC breeders. The Panel encourages CRSPs to evaluate cultivars developed by IARCs and NARS and to promote their adoption through the local technology transfer systems. Linkages between commodity CRSPs in the same regions and countries should be strengthen, and the linkages used to create a **virtual CRSP** to assemble and disband scientific expertise to solve host plant resistance breeding problems outside their mandates. Commodity CRSPs should also establish strong linkages with the IPM CRSP so as to identify HPR needs, help integrate new varieties into IPM programs, and promote IPM adoption.

6. USAID should develop a coherent internal implementation policy on pesticides and biotechnology (and any "private good" service) to foster their use in regional programs within the context of sound IPM programs. USAID should foster the adoption of appropriate biotechnology in IPM, but its need and benefit should be assessed prior to its introduction. USAID should help establish global policy for biotechnology and pesticide adoption based on sound scientific assessments using methods from ecosystems analysis, and not based simply on national or commercial interests. This policy should undergo periodic reevaluation as scientific findings clarify issues of contention.

7. USAID should foster the development and use of systems modeling and geographic information systems (GIS) technology as a cost-cutting unifying concept for IPM research and implementation in agriculture and aquaculture. Not all projects require this technology, but a versatile GIS/ modeling system should be developed to facilitate future development needs.

8. The methodology for impact assessment should be standardized so as to provide the minimum set of conditions and data to measure the impact of any proposed project or technology. Economists should be involved early in the research and implementation process.

9. IPM information should be distributed via Internet technologies (data sharing Web services) where available. Where not available, USAID Regional Bureaus should help establish the physical information technology infrastructure necessary for rapid information dissemination and exchange as exemplified by USAID's support for AfricaLink.

10. The Panel recommends leveraging MCA monies to develop a sound scientific basis for sustainable agriculture and its various components (e.g. IPM, HPR) that benefit large regions. Past examples of large permanent regional benefit are USAID funding of the CGIAR system's green revolution and the biological control of cassava pests in sub Saharan Africa. Similar gains could be made addressing parasitic plants and stemborers in maize/grain production across sub Saharan Africa, or pests such as whiteflies/gemini viruses and various weeds that impact large regional and globally important crops.

Second tier recommendations

11. Habitat management and other traditional cultural control practices play an integrative role in IPM, and this management tactic should be given a more prominent role in USAID IPM activities across CRSPs at the landscape level planning and development.

12. USAID Economic Growth, Agriculture, and Trade (EGAT) Bureau should expand its pool of scientific talent and seek the best expertise available regardless of institutional affiliation to provide high-level coordination of IPM activities across all CRSPs and related EGAT Bureau activities.

13. USAID should play a much larger role in developing global IPM policy on social science issues (e.g. gender issues, farmer field schools). It should foster socio-economic and policy research in three broad areas: (i) economically defined crop loss assessment, (ii) national crop protection policies and international trade issues (i.e. IPM and globalization), and (iii) impact assessment that incorporates natural resource management aspects. To facilitate this, USAID should forge stronger links with regional CGIAR IARCs, especially IFPRI, the World Bank, the GIPMF and ARIs.

14. Country missions should establish long-term "train-the-trainer" programs for IPM. Regional bureaus should have a mandate to aid in coordination and dissemination of appropriate IPM information among countries within the region. USAID should develop a centralized, web-based, electronic reporting system of its activities with both internal and external access for both administrative use and public awareness of program successes.

Sustainable Agriculture Expert Panel Recommendations
(From Section 5, Recommendations to "SPARE" on Future Directions and Organization, of Panel Report)

From the discussion above, the Panel draws the following conclusions and makes the following recommendations:

5.1. Conclusions

Sustainable agriculture is of fundamental importance to the poverty alleviation mission of USAID. Much of the work that USAID has been doing in agriculture is already supporting this objective. The SANREM CRSP has been an effective instrument, and the support provided to the CGIAR has been effective. The RAISE partnership has proven to be successful, though issues of land tenure and business skills among the rural poor still need further development. The NRM InterCRSP project in West Africa has made important contributions, though these were limited by regional shortage of local expertise and inadequate and variable quality of ICT capacities.

The considerable attention USAID is giving to biotechnology reflects a comparative advantage of the US research community. The Collaborative Agricultural Biotechnology Initiative, the Agricultural Biotechnology Support Project and the support to the Global Gene Bank Conservation Trust are all positive contributions to the further development of biotechnology. That said, the panel encourages USAID to be cautious in giving excessive attention to technology issues when many of the basic problems facing the rural poor are linked to issues of tenure, access to markets, social factors and other elements that have little to do directly with technology. USAID should support the development of three basic elements that are required to ensure that the benefits of biotechnology are delivered to the rural poor: a strong scientific community that can help select the most appropriate biotech applications and avoid those for which the risks outweigh the benefits; a better understanding of the complexities of biotechnology, especially from the combination of technologies with systems such as domestic regulations and policies, international agreements, and international research agendas; and policies that encourage both advanced research in the laboratory and in field experimental stations, supported by regulatory systems on the ground that can ensure the safety of new technologies for both human health and the environment.

More generally, USAID needs to support activities that will give the rural poor the knowledge of what to do differently and how to do it to achieve sustainable agriculture, the resources to make the needed changes, the motivation to do it, the supporting policy structure that enables them to engage profitably in sustainable agriculture, and the governance or authority structure within which it is possible for them to succeed in what they are attempting. In selecting which activities to support, the most important ones are those that simultaneously consider environmental/agro-ecological, economic, and social issues and impacts.

The panel strongly supports increased USAID support to agriculture, especially in support of the Millennium Development Goals.

5.2. Recommendations

Given the Panel's interpretation of sustainable agriculture as being a dynamic process and not a fixed end state, the main, overarching recommendation of the Panel is that:

- **USAID should consider "sustainability" as being a fundamental criterion for all its investments in agriculture and related sectors**.

USAID should build this underlying theme into its new agriculture strategy, rather than treating it as one of four "strategic directions." The Panel believes that all USAID investments related to agriculture should be aimed at sustaining and building on the benefits and progress generated by past investments. This holds even in the case of food aid and nutrition related activities. **USAID should not invest in activities that produce agriculture-related benefits that are not sustainable.** Following on this overarching recommendation are five supporting recommendations.

RECOMMENTATION 1: USAID should create an effective overall vision and strategy for supporting sustainable agriculture that includes:

- ***Taking a long-term view.*** USAID's ongoing strategic planning exercise should look far enough into the future to ensure that its investments are longer term (required to achieve sustainability conditions); these investments may be in longer term projects or in a successive series of separate investments that ensure continuity in objectives and eventual impacts;
- ***Taking a holistic approach.*** Sustainable resolution of major agricultural issues ,or taking advantage of major opportunities to support sustainable agriculture both require consideration of multiple dimensions, from technology development (including biotechnology) through education and policy interventions and social and economic considerations; the holistic approach will involve multi-disciplinary interaction, including better links and communications among the CRSPs and IARCs;
- ***Linking across USAID sectors and organizational units.*** As detailed in the text, USAID needs to more effectively link or bridge across its units dealing with forestry, renewable energy, and transportation, and involve its country missions in doing so. Of particular importance is effective linkage between water and sustainable agriculture and between biodiversity conservation (including the "wild" elements of agroecosystems) and agricultural development.
- ***Introducing an output/impact culture in USAID projects.*** USAID, in order to achieve its ultimate goals related to sustainable poverty alleviation and food security, needs to introduce into all its activities a stronger evaluation and impact culture focused on achieving planned outputs and impacts and building on them in future investments. As an integral part of the culture, sustainability indicators need to be

developed that are realistic and achievable, along with associated evaluation mechanisms, both related to ex ante and ex post assessment..

- ***Developing an adaptive learning and management mentality.*** Such a mentality is needed to effectively blend the output/impact focus with the longer term continuity needed to implement effective sustainable agriculture. Flexibility in decision making (minimization of bureaucratic obstacles), with appropriate checks and balances, is a key to effective adaptive learning and management.

RECOMMENDATION 2: USAID should develop more effective mechanisms and a wider range of partnerships for supporting and coordinating sustainable agriculture investments. These should include:

- Coordinating USAID sustainable agriculture activities with those of other relevant agencies, both governmental and non-governmental (Cf. Annex 2).
- Establishing an NGO Advisory Panel on Sustainable Agriculture, seeking to draw on the practical field-level experience with sustainable agriculture that is being generated by grass-roots movements throughout the world.
- Continuing, and if possible increasing, USAID investments in SANREM and the CGIAR, with these investments linked specifically to progress in sustainable agriculture, broadly defined to include all associated natural resources management activities.
- Requiring that SANREM III (a) include a strategic planning exercise that focuses on creating a more unified, demand-driven and impact-focused program; (b) focus more on the role of NRM in agriculture, rather than focusing on NRM in and of itself; (c) build stronger links to other groups involved in SA-related research and training, including particularly a wider range of US organizations (public and private) as well as the IARCs and associated Systemwide programs; (d) devote greater effort to scaling up and creating international public goods through comparative analysis across site-specific research; (e) focus more on the requirements for creating enabling policy environments for introducing sustainable agricultural practices; and (f) build better links with other CRSPs such as IPM Soil Management, Livestock, etc. to leverage expertise and resources while at the same time emphasizing sustainability in these other "sister" programs.

RECOMMENDATION 3: USAID should continue to be involved in programs that focus on sustainable alleviation of poverty for poor rural populations, including specifically:

- Continuing support for strong community- based natural resources management (CBNRM) as a major vehicle for ensuring the sustainability of agriculture. Such support focused on communities is essential because sustainable agriculture requires strong community and local input, the trend in developing countries towards decentralization of decision making related to management of natural resources, the need to ensure land tenure and resource access to the poor, and the existence of potentially significant externalities that have to be locally internalized. In this regard:

    - NGOs are particularly good at working with local communities over time and USAID should target more of its investment through NGOs;
    - USAID should encourage decentralization of decision-making and at the same time invest its efforts to ensure effective and efficient linkages between different levels of government and with the private sector. All are needed in the pursuit of sustainability of institutions and practices.
- Including a focus on non-farm and non-agriculturally- based income opportunities and means of diversifying the sources of rural income.
- Giving specific consideration to policy interventions and other means to ensure and increase market access, particularly for small farmers and related secondary processors. (The expansion of regulations often makes it more expensive and difficult to bring products to market, especially when the target is organic markets in the North. Such increasing regulatory costs can serve as effective non-tariff barriers for small farmers and give marked advantage to large, often corporately-supported farmers).

RECOMMENDATION 4: USAID should take a stronger role in creating effective capacity for sustainable agriculture in target countries, including:

- Focusing more of its efforts on strengthening local capacity, through training, education and introducing new Information Communications Technologies (ICTs) and decision support systems; having well prepared locals on board when USAID and partner support terminates is a key to sustainability of the agricultural innovations and changes that get introduced by USAID investments;
- Supporting the BIFAD proposal to reintroduce university-level programs for educating persons from developing countries in key fields related to sustainable agriculture and natural resources management;
- Supporting mechanisms designed to provide relevant information to farmers in a timely way, and in forms that are immediately useful to farmers. Examples include weather forecasts, market conditions, conservation practices for erosion and flood control, and opportunities for local training.
- Supporting innovative overseas programs for young US scientists and others (through post doc fellowships, exchange programs, Peace Corp linkages) that have the dual benefits of providing on-the-ground capacity strengthening support to developing countries and preparing more U.S. scientists and others for work related to sustainable agriculture.

RECOMMENDATION 5: USAID should increase its support for more effective management of water and watersheds in the context of sustainable agriculture, broadly defined.

Water is the main emerging constraint to sustainable agriculture in most parts of the world. The U.S. is a leader in watershed and water management science and practice, so USAID support for landscape/watershed level management innovations for land and water resources can be a key to maximizing its contributions to spreading effective sustainable agricultural practices and natural resources management. Such support

should meet all the conditions outlined in Recommendation 1 above. Specific opportunities for USAID support for water and watershed management are identified in the text.

Concluding Comments on Panel Recommendations

It is recognized that SPARE would like the Panel to prioritize its recommendations and provide order of magnitude budget implications. The Panel does not feel that this is desirable or possible without considerable further analysis at the tactical and operational levels as opposed to the agreed upon strategic level adopted in the present Panel report. However, a few general comments on priorities and resource requirements may be helpful.

In terms of priorities, the Panel suggests that the recommendations are to some extent nested. Thus, the top priority is for the agency to adopt the overarching recommendation. Next in order of priority (focusing here on sustainability which was the charge given to the Panel) is Recommendation 1, which involves changes in internal "ways of doing business." If these changes in focus are not adopted, then the remaining recommendations become much less meaningful. Recommendation 3, related to the poverty focus, also is an obvious priority, given USAID's stated objectives. The recommendation is in a sense merely saying "maintain the focus on the valid objective of rural poverty reduction." Next in importance probably is Recommendation 2 related to new ways of partnering and new mechanisms for delivering impact; partnering is a low-cost method for improving the effectiveness of USAID efforts. Recommendations 4 and 5 to some extent are already being implemented by USAID; these two recommendations highlight the importance of investment in capacity strengthening and in water and watershed management and suggest that if additional resources can be generated, then these two themes should be given top priority in terms of the global investment strategy of USAID related to sustainable agriculture. The arguments for these two priorities are detailed in the body of the report.

In terms of added resource requirements, the Panel makes the point above that some of its recommendations relate to changes in the way agricultural support and investments are approached by USAID and do not necessarily call for new investments and resource requirements. Additional resource requirements would depend very much on the operational approach taken to making the recommended changes. Thus, recommendation 1 and to some extent recommendation 2 focus mainly on changes in the way in which USAID "does business." Recommendations 4 and 5 relate directly to the substance of the investments USAID makes. Again, resource requirements would depend on the extent to which previous investments are replaced with ones that fit into the categories suggested in these two recommendations, related to capacity strengthening and water and watershed management. Recommendation 3, which focuses on mechanisms and partnerships modalities, has resource implications, but no specific amounts are implied.

All the recommendations made by the Panel refer to *directions of change*. They do not attempt to identify the magnitudes of the needed changes. It would be presumptuous of the Panel to put forth magnitudes without more thorough analysis at the tactical and operational levels of the magnitudes of the needs, the operational advantages of USAID over other suppliers, and the capacities available to USAID.